Rotating the SVT in ϕ

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May 15, 2003

Why?

To move the "hot spot" to a new position on the Si to allow continued running as radiation damage occurs.

Should be relatively fast and as safe as possible.

Issues

- How far do we need to rotate?
- Is cabling a problem?
- How do we rotate?

How Far 1?

- Move "hot spot" to a new place on the module.

  See BaBar TDR pg 555

  0.2 to 0.3 radians may be enough.

  So 15 to 20 degrees may be enough.

How Far 2?

- To Move “hot spot” to the next module.

  30° “hot Spot” on overlap region probablly not a good idea?

  Need 60° to put at center of the module.

- Need data from the radiation test to decide.

Cabling

- Rotation quantized to 6.66° by matching cards and cables.

- Readout channels can be unscrambled by rearranging connections of the white cables at the the MUX Racks.

- The diodes are an exception.
  Now use two 12 1/2 pair white cables.
  In 2005 can change to standard configuration.
  (i.e. one 12 1/2 and one 18 pair cable)

How do we do it? #1

We have considered four ways.

Disassemble and reassemble.

-Time consuming (about 4 to 6 weeks)

-Dangerous?

-Takes no redesign

Not a good idea

How do we do it? #2

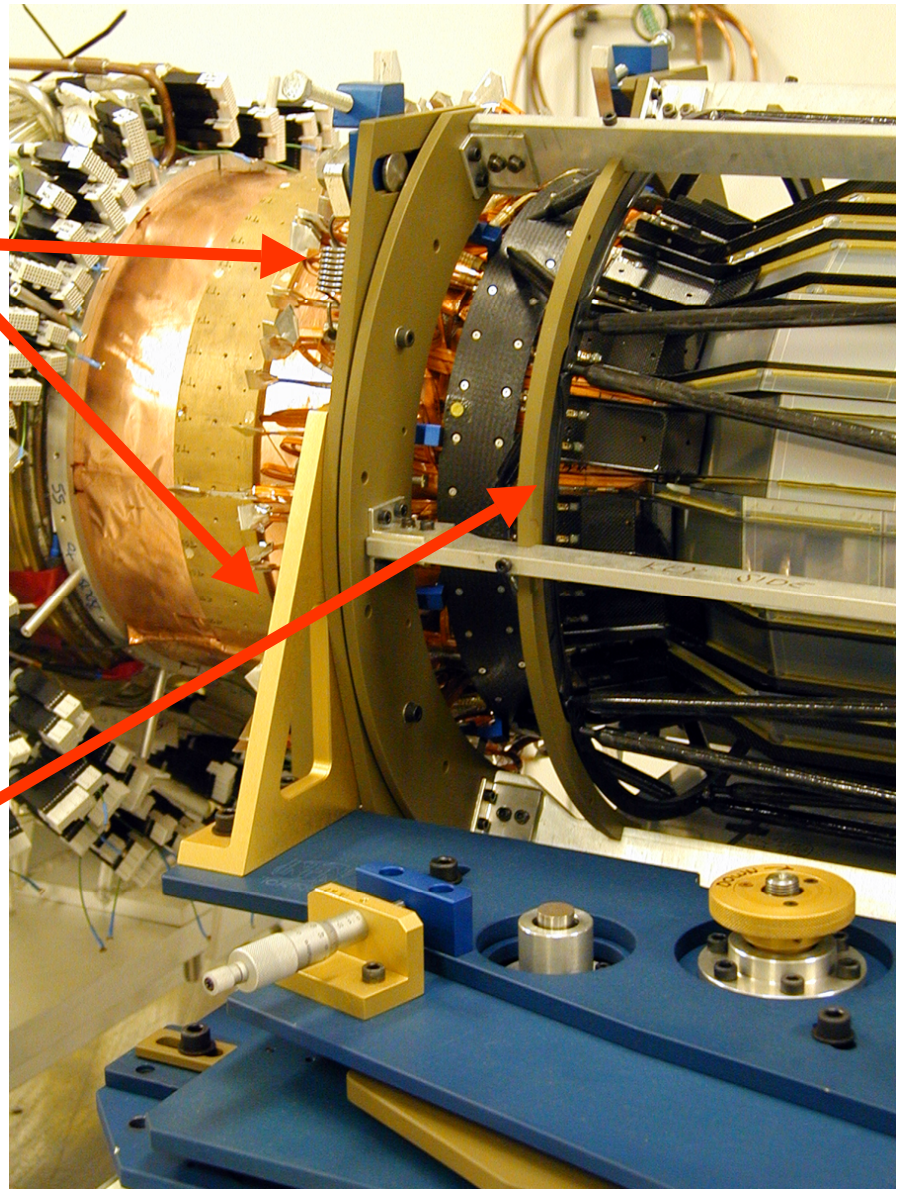
Rotate the HDMF during installation.

How do we do it? #2

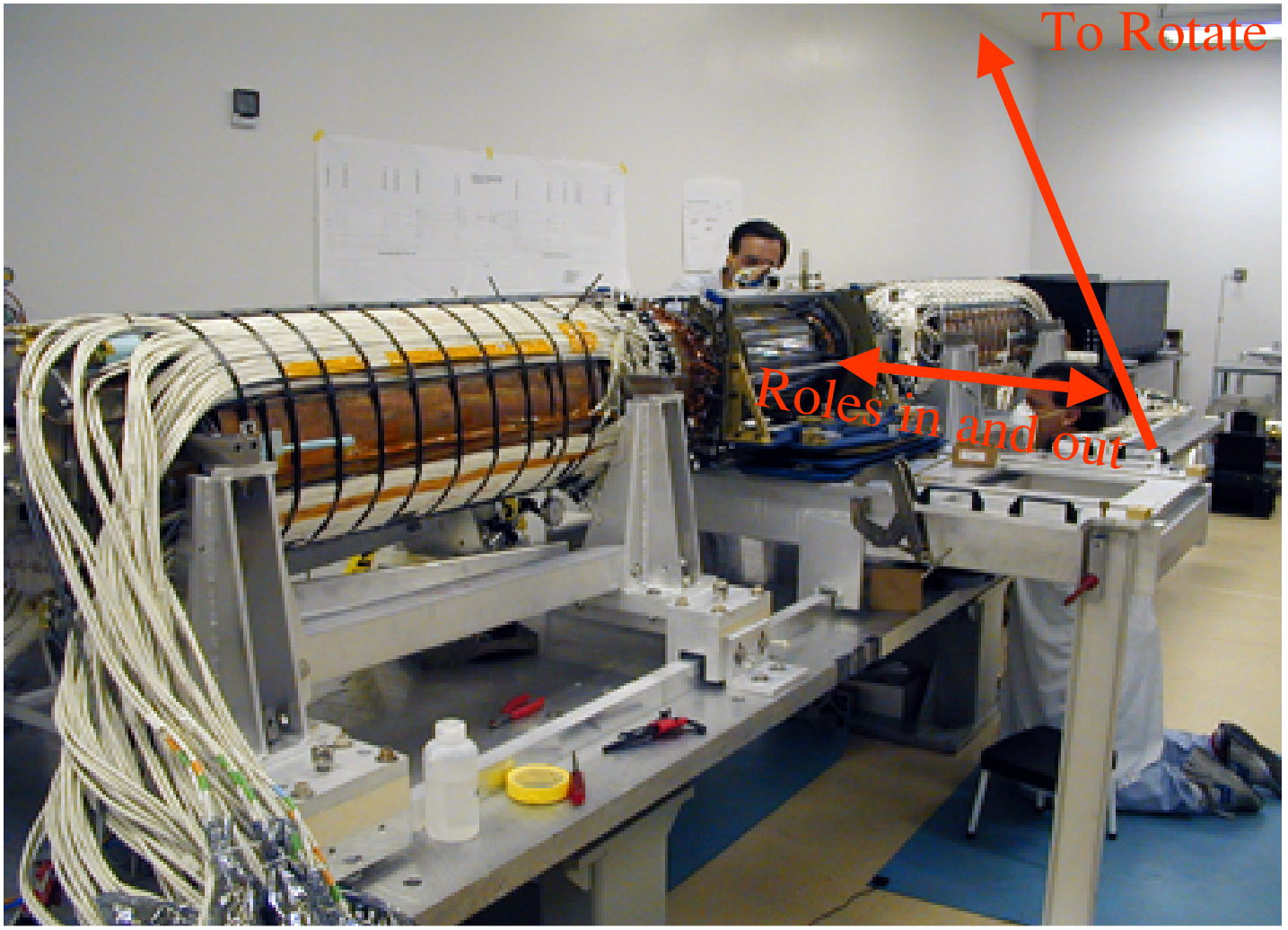
HDMF

Springs

This part floats on springs



How do we do it? #2



Rotation of The HDMF

How do we do it? #2

Rotate HDMF during installation.

-Requires HDMF be modified with counter weights.
-If rotation is more than ~10° requires considerable staging.

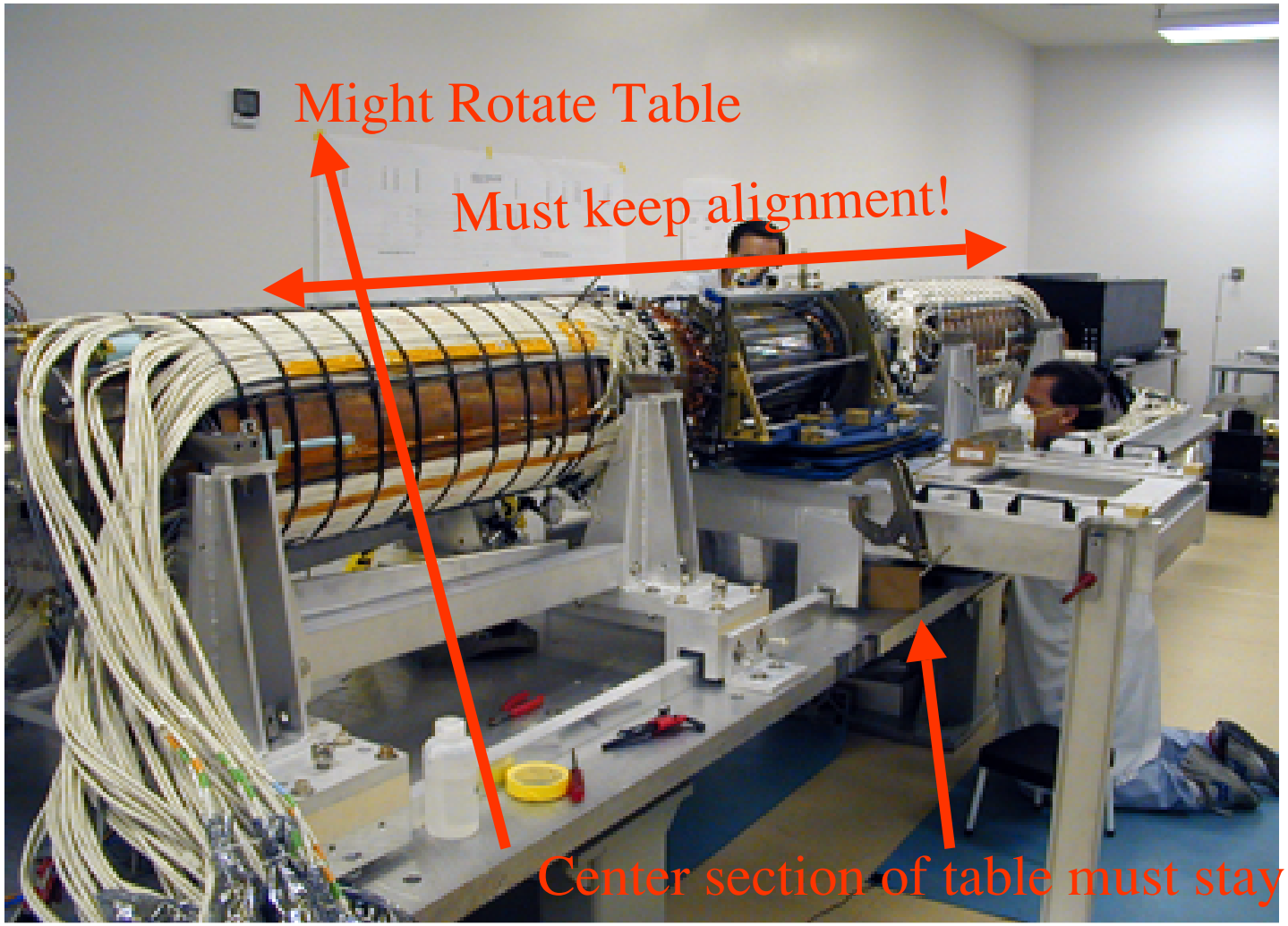
-Probably takes a week
(from end to start of cabling)

Possible but not the best idea.

How do we do it? #3

Rotate the Q1B1 assembly during installation of the SVT.

How do we do it? #3



How do we do it? #3

Rotate the Q1B1 assembly during installation of the SVT.

-Requires a very rigid support between the forward and backward magnets to prevent twisting of the Be beam pipe.

-Probablly takes more time than #2 because of the complicated setup.

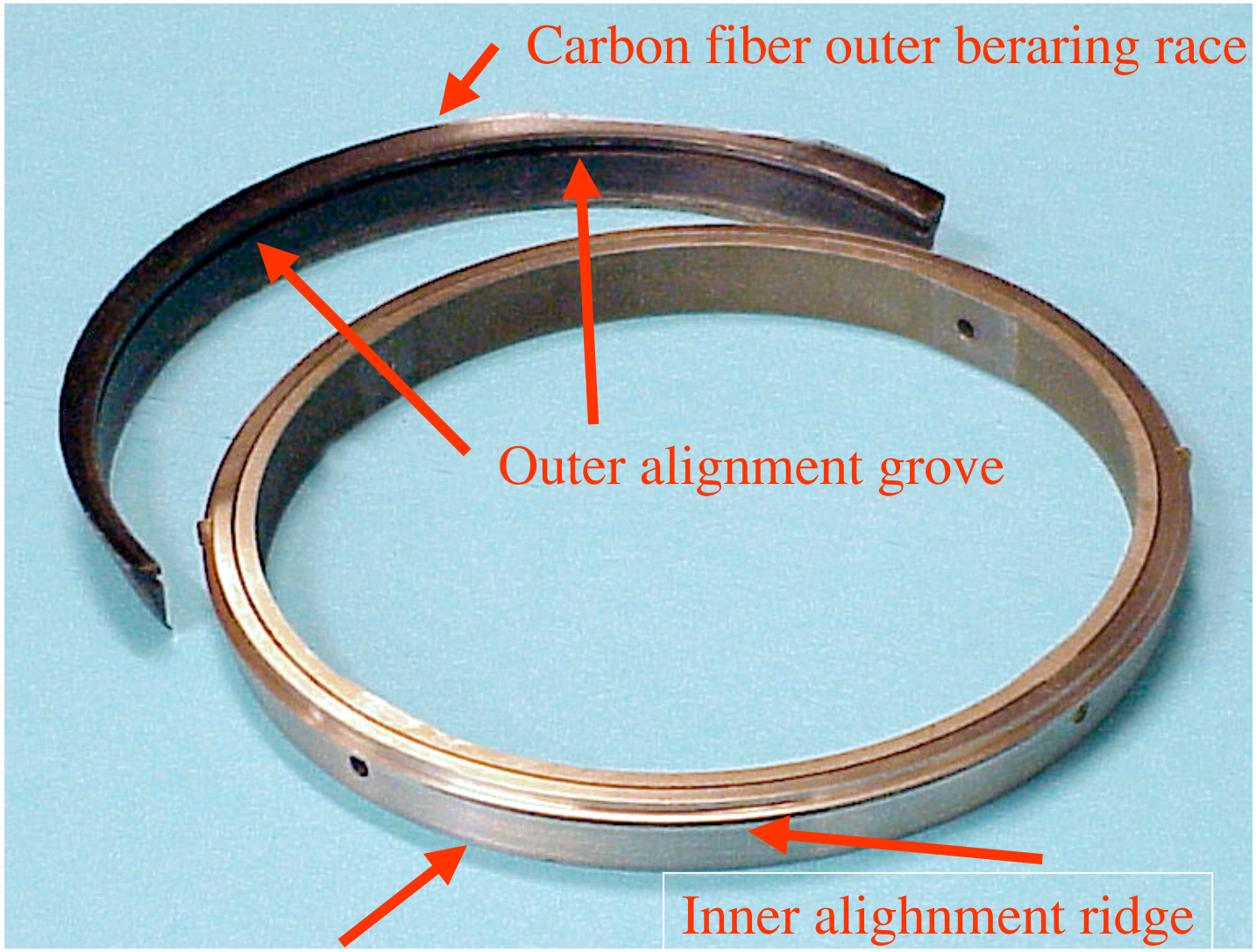
Possible but not a good idea.

How do we do it? #4

Rotate the SVT at the forward gimbal ring.

- Either build a bearing into the B1 or allow SVT to slide on the outer gimbal.
- At the moment the later looks best

How do we do it? #4



Gimbal rings

How do we do it? #4

Rotate the SVT at the forward gimbal ring.

- Only unknown is there space for the locking mechanism.
- Allows rotation of > 60°
- SVT is uncabled but not removed!
- One day.
  (from end to start of cabling)

Seems possible, some real engineering needed.

Summary of rotation methods.

#1 Does not meet the criteria

#2 Possible but difficult especially if the rotation is large ($\gtrsim 20°$)

#3 May be possible but a very big job

#4 - Safe and fast.

- Relative minor modifications
- Wide angular range.
- Needs more study to invent a lock.